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First Semester MBA Degree Examination, June/July 2025

Statistics for Managers

Time: 3 hrs.

Max. Marks: 100

- Note: 1. Answer any FOUR full questions from Q.No.1 to Q.No.7.
 2. Question No. 8 is compulsory.
 3. M : Marks , L: Bloom's level , C: Course outcomes.
 4. Statistical Table may be allowed.*

| | | | M | L | C | | | | | | | | | | | | | | | | | | |
|----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-------|-------|-------|-------|-------|----------------------|-------|-----------|----|----|----|---------------------|-----|----|----|----|----|-----|----|-----|
| Q.1 | a. | State the relationship between Mean, Median and Mode. | 3 | L1 | CO1 | | | | | | | | | | | | | | | | | | |
| | b. | Calculate missing frequencies of below table : <table><tr><td>Variable</td><td>0-10</td><td>10-20</td><td>20-30</td><td>30-40</td><td>40-50</td><td>50-60</td><td>60-70</td></tr><tr><td>Frequency</td><td>10</td><td>20</td><td>?</td><td>40</td><td>?</td><td>25</td><td>15</td></tr></table> Median = 35 , Total frequency = 170. | Variable | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | Frequency | 10 | 20 | ? | 40 | ? | 25 | 15 | 7 | L2 | CO2 | | |
| | Variable | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | | | | | | | | | | | | | | | |
| Frequency | 10 | 20 | ? | 40 | ? | 25 | 15 | | | | | | | | | | | | | | | | |
| c. | Blood Serum Cholesterol levels of 10 persons are as under : 240 , 260 , 290 245 , 255 , 288 , 272 , 263 , 277 and 251. Calculate SD with the help of Assumed Mean = 264. | 10 | L2 | CO2 | | | | | | | | | | | | | | | | | | | |
| Q.2 | a. | Distinguish between Positive , Negative and Zero correlation. | 3 | L4 | CO2 | | | | | | | | | | | | | | | | | | |
| | b. | Calculate Karl Pearson's coefficient of correlation for following data : <table><tr><td>Roll No. of student</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td></tr><tr><td>Marks in Accountancy</td><td>48</td><td>35</td><td>17</td><td>23</td><td>47</td></tr><tr><td>Marks in Statistics</td><td>45</td><td>20</td><td>40</td><td>25</td><td>45</td></tr></table> | Roll No. of student | 1 | 2 | 3 | 4 | 5 | Marks in Accountancy | 48 | 35 | 17 | 23 | 47 | Marks in Statistics | 45 | 20 | 40 | 25 | 45 | 7 | L3 | CO2 |
| | Roll No. of student | 1 | 2 | 3 | 4 | 5 | | | | | | | | | | | | | | | | | |
| Marks in Accountancy | 48 | 35 | 17 | 23 | 47 | | | | | | | | | | | | | | | | | | |
| Marks in Statistics | 45 | 20 | 40 | 25 | 45 | | | | | | | | | | | | | | | | | | |
| c. | From the following data obtain two regression equations (X on Y and Y on X) : <table><tr><td>X</td><td>6</td><td>2</td><td>10</td><td>4</td><td>8</td></tr><tr><td>Y</td><td>9</td><td>11</td><td>5</td><td>8</td><td>7</td></tr></table> | X | 6 | 2 | 10 | 4 | 8 | Y | 9 | 11 | 5 | 8 | 7 | 10 | L4 | CO4 | | | | | | | |
| X | 6 | 2 | 10 | 4 | 8 | | | | | | | | | | | | | | | | | | |
| Y | 9 | 11 | 5 | 8 | 7 | | | | | | | | | | | | | | | | | | |
| Q.3 | a. | What is Bernoulli Experiment? | 3 | L1 | CO1 | | | | | | | | | | | | | | | | | | |
| | b. | The mean of a Binomial distribution is 6. The standard deviation is $\sqrt{2}$. Find n & P. | 7 | L3 | CO2 | | | | | | | | | | | | | | | | | | |
| | c. | The probability that a bomb dropped on a bridge hits it is 0.4. Eight bombs are dropped on the bridge. Two bomb – hits are enough to destroy the bridge. Find the probability that i) All the bomb bit the bridge ii) Two bombs hit the bridge iii) The bridge is destroyed. | 10 | L4 | CO3 | | | | | | | | | | | | | | | | | | |

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| Q.4 | a. | What is time series? | 3 | L1 | CO2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | b. | Discuss various methods that can be used for determining trend. | 7 | L2 | CO2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | c. | Calculate 5 – yearly and 7 – yearly moving average for the following data of the number of commercial and industrial failures in a country during 1988 to 2003. <table><tr><td>Year</td><td>1988</td><td>1989</td><td>1990</td><td>1991</td><td>1992</td><td>1993</td><td>1994</td><td>1995</td></tr><tr><td>No. of Failures</td><td>23</td><td>26</td><td>28</td><td>32</td><td>20</td><td>12</td><td>12</td><td>10</td></tr><tr><td>Year</td><td>1996</td><td>1997</td><td>1998</td><td>1999</td><td>2000</td><td>2001</td><td>2002</td><td>2003</td></tr><tr><td>No. of Failures</td><td>9</td><td>13</td><td>11</td><td>14</td><td>12</td><td>9</td><td>3</td><td>1</td></tr></table> | Year | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | No. of Failures | 23 | 26 | 28 | 32 | 20 | 12 | 12 | 10 | Year | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | No. of Failures | 9 | 13 | 11 | 14 | 12 | 9 | 3 | 1 | 10 | L4 |
| Year | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Failures | 23 | 26 | 28 | 32 | 20 | 12 | 12 | 10 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Year | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of Failures | 9 | 13 | 11 | 14 | 12 | 9 | 3 | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Q.5 | a. | What are Type – I and Type = II error? | 3 | L1 | CO2 |
| b. | The life time of electric bulbs for a random samples of 10 form a large consignment gave the following data : | | | | | | | | | | | | |--------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----| | Item | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | | Life in '000 hours | 4.2 | 4.6 | 3.9 | 4.1 | 5.2 | 3.8 | 3.9 | 4.3 | 4.4 | 5.6 | [Note : Table value of t @ 5% is 2.262] Can we accept the hypothesis that the average life time of bulbs in 4,000 hrs. | 7 | L4 | CO4 |
| c. | In an anti malarial campaign in a certain area, quinine was admistered to 812 persons out of a total population of 3248. The number of fever cases is shown below : | | | | | |------------|-------|----------|-------| | Treatment | Fever | No Fever | Total | | Quinine | 20 | 792 | 812 | | No Quinine | 220 | 2216 | 2436 | | Total | 240 | 3008 | 3248 | Discuss the usefulness of quinine in checking malaria. [Table value @ 5% = 3.84]. | 10 | L4 | CO4 |
| Q.6 | a. | What is Statistics? | 3 | L1 | CO1 |
| b. | The mean height of 25 male workers in a factory is 61 inches and the mean height of 35 female workers in the same factory is 58 inches. Find the combined mean of 60 workers in the factory. | 7 | L2 | CO2 |
| c. | Calculate mode from following data : | | | | | | | |-----------------|-------|-------|-------|-------|--------| | Marks | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | | No. of students | 3 | 5 | 7 | 10 | 12 | | Marks | 50-60 | 60-70 | 70-80 | 80-90 | 90-100 | | No. of students | 15 | 12 | 6 | 2 | 8 | | 10 | L5 | CO4 |

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| Q.7 | a. | What is Baye's Theorem? | 3 | L1 | CO1 | | | | | | | | | | | | | | | | | | | | | | | | |
| | b. | In a Poisson Distribution $P[X=2] = P[X=3]$. Find $P[X=4]$. (Note : $e^{-3} = 0.0498$). | 7 | L4 | CO4 | | | | | | | | | | | | | | | | | | | | | | | | |
| | c. | Discuss applications of statistics in Business Economics , Physical science , Research and Natural science. | 10 | L2 | CO2 | | | | | | | | | | | | | | | | | | | | | | | | |
| Q.8 | a. | From the prices of shares X and Y below, find out which is more stable in value : <table border="1"> <tr><td>X</td><td>35</td><td>54</td><td>52</td><td>53</td><td>56</td></tr> <tr><td>Y</td><td>108</td><td>107</td><td>105</td><td>105</td><td>106</td></tr> <tr><td>X</td><td>58</td><td>52</td><td>50</td><td>51</td><td>41</td></tr> <tr><td>Y</td><td>107</td><td>104</td><td>103</td><td>104</td><td>101</td></tr> </table> | X | 35 | 54 | 52 | 53 | 56 | Y | 108 | 107 | 105 | 105 | 106 | X | 58 | 52 | 50 | 51 | 41 | Y | 107 | 104 | 103 | 104 | 101 | 10 | L5 | CO4 |
| X | 35 | 54 | 52 | 53 | 56 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | 108 | 107 | 105 | 105 | 106 | | | | | | | | | | | | | | | | | | | | | | | | |
| X | 58 | 52 | 50 | 51 | 41 | | | | | | | | | | | | | | | | | | | | | | | | |
| Y | 107 | 104 | 103 | 104 | 101 | | | | | | | | | | | | | | | | | | | | | | | | |
| | b. | Explain in detail procedure of hypothesis testing. | 10 | L2 | CO3 | | | | | | | | | | | | | | | | | | | | | | | | |
